Anthracene

Chemical Information.
CAS Number - 120-12-7
Alternate Names - paraNaphthalene, anthracin, anthraxcene
General Uses - This chemical is used to make dyes, plastics and pesticides. It has been used to make smoke screens and scintillation counter crystals.
Potential Hazards - This chemical may cause irritation of the eyes and respiratory tract. It may also irritate the gastrointestinal tract if swallowed. It is combustible.

Summary Analysis– Anthracene.

- Anthracene comprised 0.5 percent of the total PC quantity reported in 2003, for a total quantity of 419,068 pounds. There was approximately a 7.5 percent increase in the PC quantity of anthracene reported from 1999 to 2003.
- Since 1999, there has been an increase in treatment of anthracene and a corresponding decrease in energy recovery. Recycling of anthracene also has decreased.
- Of the 37 facilities that reported anthracene in 2003, one facility accounted for over 64 percent of the total quantity of this chemical; 5 of the 37 facilities accounted for 90 percent of the total quantity.
- In 2003, about 88 percent of the anthracene was reported by facilities in Regions 4 and 5. There was a sizable decrease in the PC quantity of anthracene reported by facilities in Region 6.
- Although facilities in 20 states reported a PC quantity of anthracene in 2003, facilities in 9 of these states accounted for over 99 percent of the total PC quantity of anthracene. Facilities in Kentucky, reported about 65 percent of the total quantity with an increase of over 427 percent since 1999.
- Facilities in 5 industry sectors (SIC codes) accounted for over 99 percent of the PC quantity of anthracene reported in 2003. One facility, in SIC 3334 (Primary Aluminum), accounted for over 64 percent of the total PC quantity of anthracene.

National Trends – Anthracene. Exhibit 4.20 presents the total PC quantity (lbs.) of anthracene in 1999 to 2003, showing the disposal, treatment, energy recovery, as well as recycling quantities. In 2003, anthracene accounted for about 0.5 percent of the total quantity of PCs. Although there has been an increase in the number of facilities reporting anthracene, there has been a decrease (-7.5%) in the PC quantity of anthracene reported from 1999 to 2003.

In 2003, there were significant changes regarding the usage of management methods for anthracene. The quantity going to disposal had been declining since 1999 but increased considerably in 2003. There also was a considerable increase in the treatment of anthracene. However, energy recovery declined significantly. Recycling also dropped off in 2003.

Exhibit 4.20. **N**ational-Level Information for Anthracene

	1999	2000	2001	2002	2003	Percent Change (1999-2003)	Management Method -- Percent of Quantity of this Chemical in 2003
Number of Facilities	29	32	34	34	37	27.6%	
Disposal Quantity (lbs.)	73,355	50,659	57,334	26,515	82,502	12.5%	4.9%
Energy Recovery Quantity (lbs.)	289,337	283,490	187,988	262,799	24,482	-91.5%	1.5%
Treatment Quantity (lbs.)	90,562	212,149	115,507	56,168	312,084	244.6%	18.6%
Priority Chemical Quantity (lbs.)	453,254	546,297	360,830	345,482	419,068	-7.5%	
Recycling Quantity (lbs.)	247,344	222,786	373,799	372,813	134,396	-45.7%	

Exhibit 4.21 shows the number of facilities that reported anthracene within various quantity ranges. Of the 37 facilities that reported anthracene in 2003, one facility accounted for over 64 percent of the total quantity of this chemical. Five of the 37 facilities accounted for 90 percent of the total PC quantity of anthracene in 2003.

Exhibit 4.21. Distribution of Facilities that Reported Quantities for Anthracene (2003)

Anthracene (419,608 pounds)		
Quantity Reported	**Number of Facilities Reporting this quantity (2003)**	**Percent of Total Quantity for this Priority Chemical**
up to 10 pounds	7	less than 0.1%
between 11 - 100 pounds	5	less than 0.1%
between 101 -1,000 pounds	13	1.0%
between 1,001 - 10,000 pounds	7	8.9%
between 10,001 - 100,000 pounds	4	25.8%
between 100,001 - 1 million pounds	1	64.2%
> 1 million pounds	0	0.0%

EPA Region Trends- Anthracene. Exhibit 4.22 shows the quantity (pounds) of anthracene in each EPA Region where facilities reported this PC in 1999-2003. In 2003, almost 88 percent of the anthracene was reported by facilities in Regions 4 and 5. In particular, there was a considerable increase in the quantity of anthracene in Region 4. Although Region 5 had the second largest quantity of anthracene in 2003, its quantity has decreased, for the most part, including an almost 50 percent decrease compared to the 2002 quantity. There likewise has been a sizable decrease in the PC quantity of anthracene in Region 6. Exhibit 4.23 shows the regional quantities of anthracene and the facilities that reported anthracene in 2003.

Exhibit 4.22. Quantity of Anthracene Reported by EPA Regions (1999-2003)

EPA REGION	1999	2000	2001	2002	2003	Percent Change in Quantity (1999-2003)	Percent Of the Total Priority Chemical quantity (2003)
3	18,160	35,239	7,353	6,686	18,345	1.0%	4.4%
4	53,189	4,229	2,869	4,090	276,556	419.9%	66.0%
5	103,510	128,042	61,054	179,877	91,646	-11.5%	21.9%
6	278,331	378,757	289,097	154,488	31,882	-88.5%	7.6%
8	63	30	363	250	536	750.8%	0.1%
9	0	0	0	6	5	NA	0.0%
10	1	0	94	85	98	9700.0%	0.0%
Total	453,254	546,297	360,830	345,482	419,068	-7.5%	100.0%

Exhibit 4.23. Distribution of Facilities Reporting anthracene in 2003 & Quantity of anthracene Reported in 2003, by Region

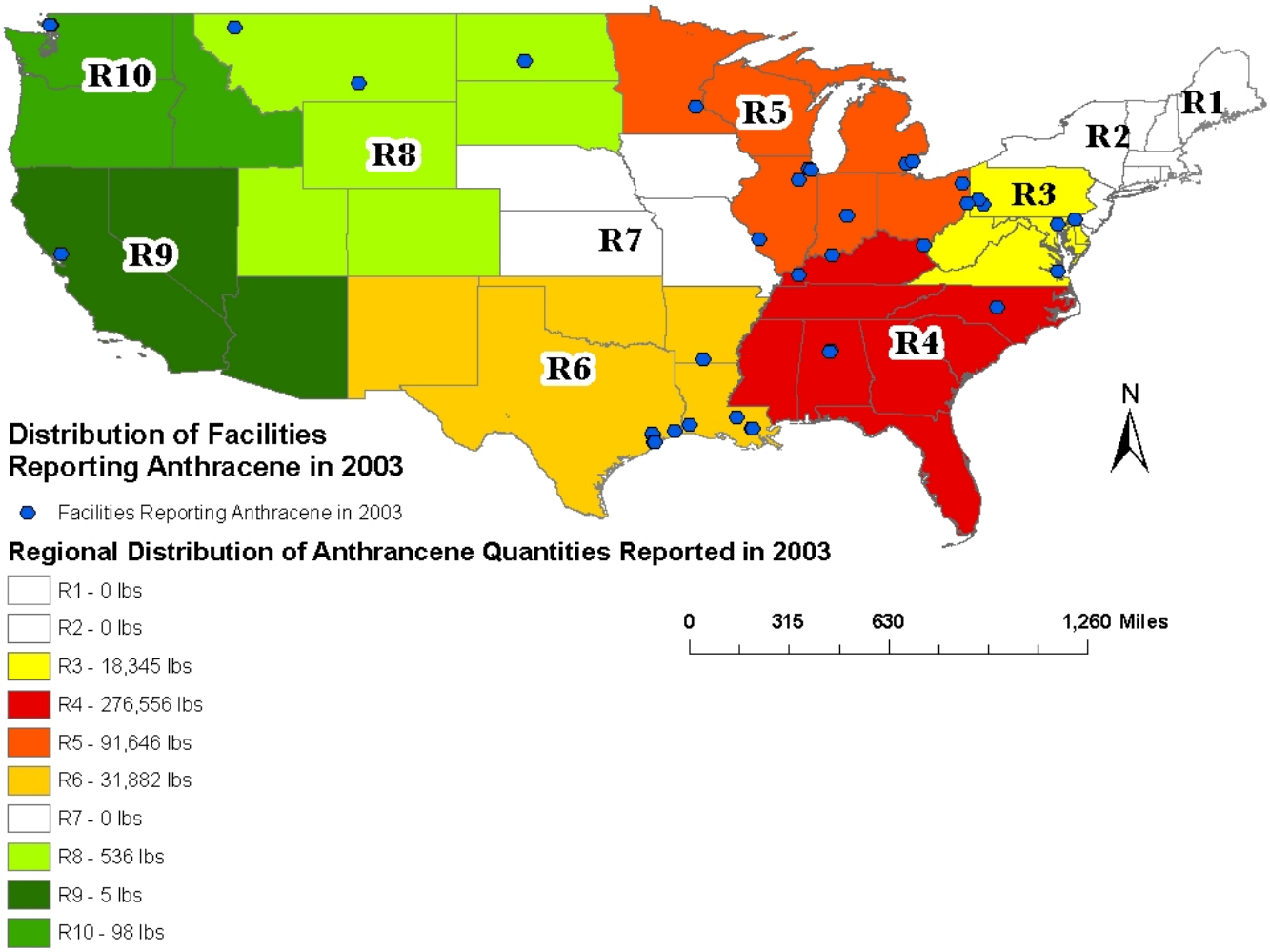


Exhibit 4.24 shows how facilities managed anthracene within each EPA Region in 2003. Most of the PC quantity of anthracene was treated onsite, particularly by facilities in Region 4. In

Region 5, much of the anthracene was sent to offsite disposal. In Region 6, the anthracene was primarily managed via onsite energy recovery; a notable quantity also was recycled.

Exhibit 4.24. Management Methods for Anthracene, By EPA Region (2003)

	Disposal		Energy Recovery		Treatment		Recycling	
EPA Region	Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
3	0	13,706	0	257	1,126	3,256	201	8,300
4	255	2,568	1	2,800	268,671	2,261	82,790	55
5	516	64,577	0	130	26,265	158	19,049	2
6	288	57	18,156	3,134	4,878	5,369	0	23,880
8	535	0	0	0	0	1	113	6
9	0	0	0	0	0	5	0	0
10	0	0	4	0	75	19	0	0
Total	1,594	80,908	18,161	6,321	301,015	11,069	102,153	32,243

State Trends- Anthracene. Exhibit 4.25 shows the quantity of anthracene in those states where facilities report this chemical, between 1999 and 2003. Although facilities in 20 states reported a PC quantity of anthracene in 2003, facilities in only 9 of these states accounted for over 99 percent of the total PC quantity of anthracene. Kentucky, with almost 65 percent of the total quantity, had an increase of over 427 percent since 1999 (Exhibit 4.26). Facilities in Michigan, with nearly 14 percent of the total quantity, only started reporting anthracene since 2002. Texas facilities had a considerable decrease – almost 240,000 pounds since 1999, a 90 percent decrease (Exhibit 64). Notable decreases also occurred in Ohio (-86,942 pounds (-99.8%)), Louisiana (-8,648 pounds, (-62.1%)), and West Virginia (-5,769 pounds, (-36.1%)).

Exhibit 4.25. State-Level Information for Anthracene (1999-2003)

	Total Quantity (pounds) of Priority Chemical							
State	1999	2000	2001	2002	2003	Change in Quantity (1999-2003)	Percent of Total Quantity of this Priority Chemical (2003)	Percent Change in Quantity (1999-2003)
Kentucky	51,370	1,004	962	1,878	270,887	219,517	64.6%	427.3%
Michigan	0	0	0	888	57,719	57,719	13.8%	NA
Illinois	16,354	14,963	2,560	9,372	33,573	17,219	8.0%	105.3%
Texas	264,402	373,863	275,398	144,427	26,466	-237,936	6.3%	-90.0%
West Virginia	15,959	33,527	6,029	4,300	10,190	-5,769	2.4%	-36.1%
Pennsylvania	2,201	1,712	1,319	2,380	7,652	5,451	1.8%	247.7%
Alabama	1,549	3,201	1,827	2,176	5,551	4,002	1.3%	258.4%
Louisiana	13,929	4,818	13,638	9,959	5,281	-8,648	1.3%	-62.1%

State	1999	2000	2001	2002	2003	Change in Quantity (1999-2003)	Percent of Total Quantity of this Priority Chemical (2003)	Percent Change in Quantity (1999-2003)
Montana	0	0	250	250	535	535	0.1%	NA
Virginia	0	0	0	3	274	274	0.1%	NA
Ohio	87,155	112,814	58,486	169,615	213	-86,942	0.1%	-99.8%
Maryland	0	0	0	0	203	203	0.0%	NA
Indiana	1	12	5	1	136	135	0.0%	13500.0%
Arkansas	0	76	61	102	135	135	0.0%	NA
North Carolina	270	24	80	36	118	-152	0.0%	-56.2%
Washington	0	0	94	85	98	98	0.0%	NA
Delaware	0	0	5	3	26	26	0.0%	NA
California	0	0	0	6	5	5	0.0%	NA
Minnesota	0	253	3	1	5	5	0.0%	NA
North Dakota	0	0	2	0	1	1	0.0%	NA
Oregon	1	0	0	0	0	-1	0.0%	-100.0%
Utah	63	30	111	0	0	-63	0.0%	-100.0%
Total	453,254	546,297	360,830	345,482	419,068	-34,186	100.0%	-7.5%

Exhibit 4.26. Anthracene Significant Quantity Trends (1999-2003): Facilities in Texas and Kentucky

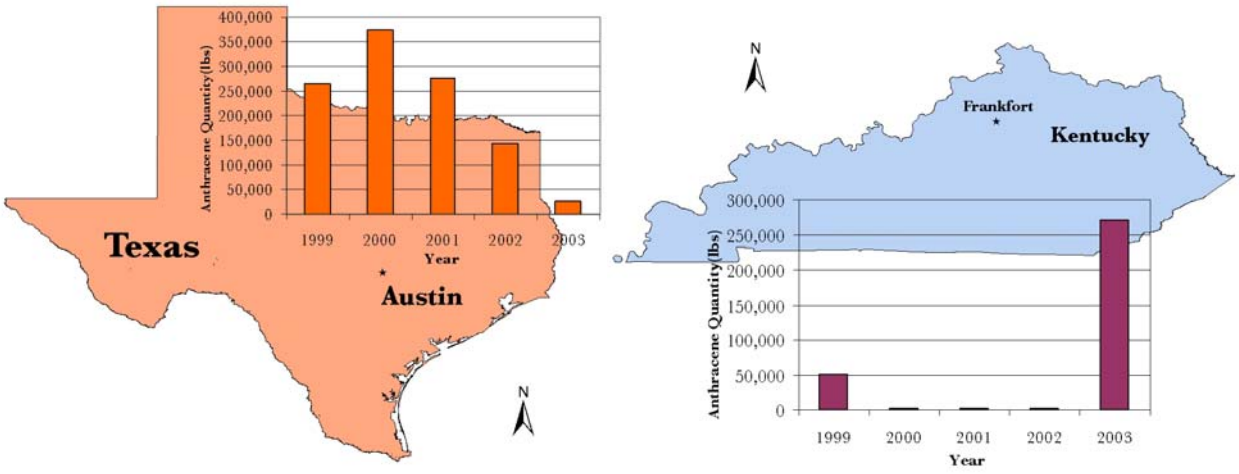
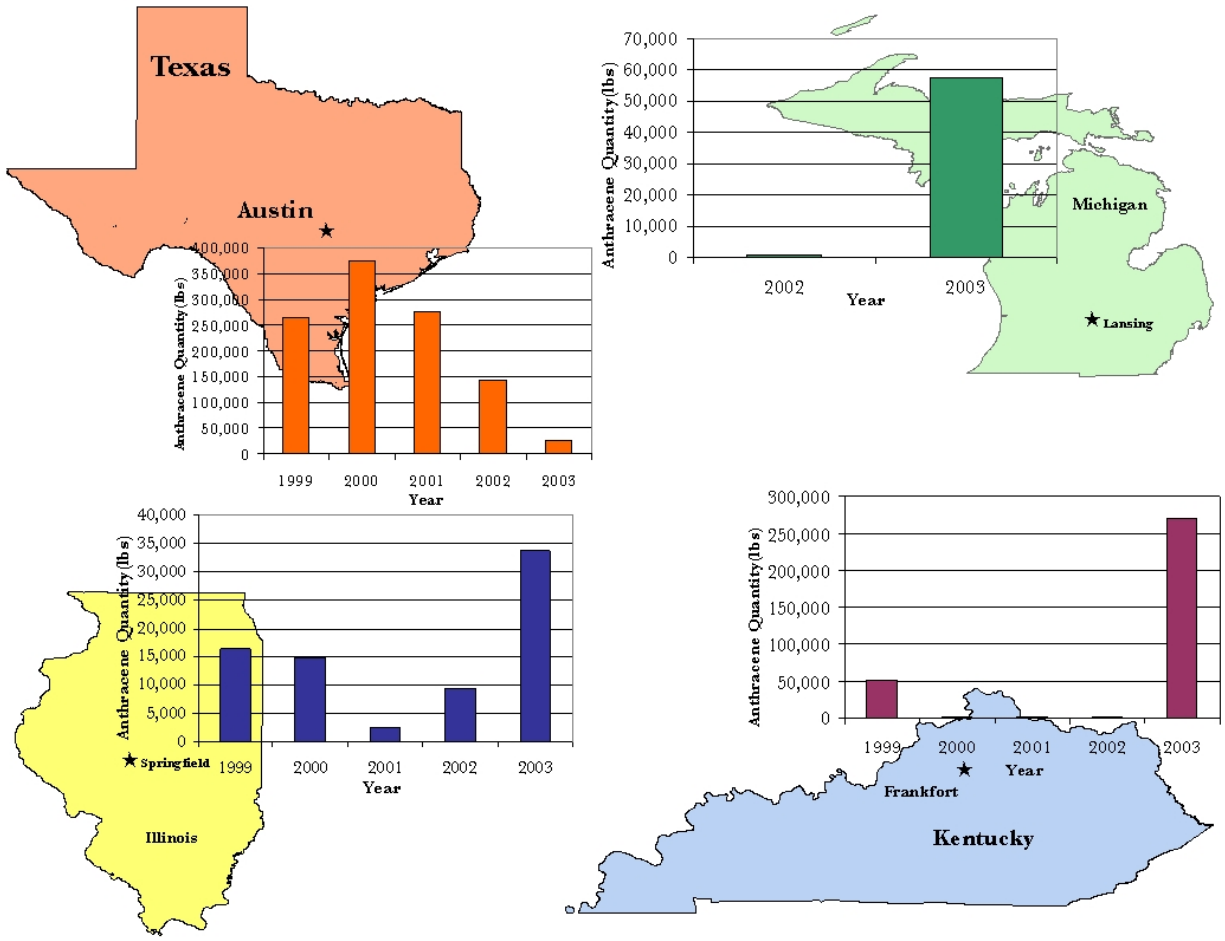


Exhibit 4.27 shows how anthracene was managed by facilities in the 4 states that accounted for over 90 percent of the total quantity of this PC in 2003. Most of the anthracene was treated, primarily onsite, especially by facilities in Kentucky and Illinois. Energy recovery was the primary management method in Texas. Michigan facilities sent their anthracene to land disposal. Recycling of notable quantities occurred in Kentucky and Texas.

Exhibit 4.27. Management of Anthracene in States with 90 Percent of Total Quantity (2003)

State	Total Priority Chemical Quantity (2003)	Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
Kentucky	270,887	255	1,450	0	250	268,671	261	70,150	55
Michigan	57,719	516	57,203	0	0	0	0	0	0
Illinois	33,573	0	7,155	0	130	26,265	23	1,089	0
Texas	26,466	288	2	18,156	3,085	0	4,935	0	23,880

Exhibit 4.28. Trends Analyses of States with 90 Percent of Total Quantity (2003)



Industry Sector (SIC) Trends- Anthracene. Exhibit 4.29 shows the PC quantity (pounds) of anthracene for the five industry sectors (SIC codes) where facilities reported over 99 percent of this chemical in 2003. Facilities in SIC 3334 (Primary Aluminum) reported the highest quantities, accounting for over 64 percent of the total PC quantity of anthracene reported in 2003. One facility in this sector, located in Kentucky, reported over 99 percent of the quantity for SIC 3334. This facility, reported 250 pounds in both 2001 and 2002; however, in 2003, their reported quantity increased dramatically to almost 270,000 pounds. Compared to the quantities

reported in 1999, there was a significant decrease in the quantity of anthracene reported in 2003 by two of the top 5 industry sectors: SIC 2865 --Cyclic crudes and intermediates (-31.6%) and SIC 2869 - Industrial organic chemicals, nec (-84.6%).

Exhibit 4.29. Industry Sector-Level Information for Anthracene (1999-2003)

Primary SIC Code	SIC Description	Number of Facilities for this SIC Code (2003)	1999	2000	2001	2002	2003	Change in Quantity (1999-2003)	Percent of Total Quantity of this Priority Chemical (2003)
3334	Primary aluminum	2	0	0	250	250	269,580	NA	64.3%
2865	Cyclic crudes and intermediates	5	121,742	165,658	69,965	186,745	83,230	-31.6%	19.9%
2869	Industrial organic chemicals, nec	6	208,553	203,848	96,761	79,703	32,096	-84.6%	7.7%
2821	Plastics materials and resins	1	0	0	0	0	22,536	NA	5.4%
3312	Blast furnaces and steel mills	4	1,540	339	117	354	7,866	410.8%	1.9%

Exhibit 4.30 shows how anthracene was managed by facilities in the five industry sectors that accounted for over 90 percent of the total quantity of this PC in 2003. Most of the anthracene was treated, primarily onsite, particularly by facilities in SIC 3334 – Primary Aluminum. Facilities in the SIC 2865 – Cyclic crudes and intermediates industry sector primarily sent the anthracene to offsite disposal. Facilities in SIC 2869 - Industrial organic chemicals, nec, and SIC 3312 – Blast Furnaces and steel mills accounted for most of the anthracene that was recycled in 2003.

Exhibit 4.30. Management of Anthracene in Industry Sectors (SIC Codes) with 90 Percent of Total Quantity (2003)

Primary SIC Code	SIC Description	Total Priority Chemical Quantity	Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
3334	Primary aluminum	269,580	500	1,449	0	0	267,631	0	113	0
2865	Cyclic crudes and intermediates	83,230	0	72,463	0	2,592	4,919	3,256	1,089	0
2869	Industrial organic chemicals, nec	32,096	250	53	18,156	3,085	5,190	5,362	70,000	23,880
2821	Plastics materials and resins	22,536	0	0	0	88	22,446	2	0	0
3312	Blast furnaces and steel mills	7,866	0	6,064	1	0	0	1,801	12,755	8,300

Recycling. Exhibit 4.31 provides some indication of the extent to which facilities in certain industry sectors recycled at least 100 pounds of anthracene in 1999-2003, rather than manage it as a waste. For those year(s), the facility did not report a PC quantity, i.e., a quantity managed via land disposal, energy recovery, or treatment.

Exhibit 4.31. Facilities reporting Recycling but not a Priority Chemical quantity (1999-2003)

			1999		2000		2001		2002		2003	
Number of Facilities	**EPA Region**	**State**	**Onsite Recycle**	**Offsite Recycle**	**Onsite Recycle**	**Offsite Recycle**	**Onsite Recycle**	**Offsite Recycle**	**Onsite Recycle**	**Offsite Recycle**	**Onsite Recycle**	**Offsite Recycle**
SIC 2491-- Wood Preserving												
1	2	Connecticut	0	0	866	0	818	0	1,501	0	1,456	0
SIC 2865-- Cyclic Crudes and Intermediates												
1	4	Alabama	0	0	0	0	0	0	200	0	200	0
SIC 2911-- Petroleum Refining												
1	6	Louisiana	183,679	0	0	0	0	0	0	0	0	0
1	6	Texas	101,000	0	0	0	0	0	0	0	39,896	0
SIC 3312-- Blast Furnaces and Steel Mills												
1	2	New York	0	0	2,765	0	2,953	0	2,822	0	2,727	0
3	3	Pennsylvania	88,000	0	433,839	0	580,091	14,246	18,000	10,120	15,317	0
2	4	Alabama	7,467	0	2,130	0	671	0	721	0	840	0